A[1]

producing a steam-containing exhaust having an expansion potential from the fuel burner; driving an expander using the expansion potential of the steam-containing exhaust; and, recovering mechanical energy from the expander.

2. (Once Amended) The method of Claim 1, further comprising the step of preheating the air/steam mixture in the steam-containing exhaust of the fuel burner before introduction into the burner.

A[2]

4. (Once Amended) The method of Claim 1, further comprising the step of introducing additional water into the air/steam mixture.

5. (Once Amended) The method of Claim 4, wherein the step of introducing additional water occurs after the mixture has emerged from the fuel cell.

A[3]

16. (Once Amended) The method of Claim 15, further comprising the step of removing water from the air/steam mixture at a selected point in the path before introduction of the mixture into the burner.

A[4]

40. (Once Amended) The method of Claim 28, further comprising the step of introducing additional water into the air/steam mixture.

41. (Once Amended) The method of Claim 40, wherein the step of introducing additional water occurs after the mixture has emerged form the fuel cell.

A[5]

43. (Once Amended) The method of Claim 42, further comprising the step of removing water from the air/steam mixture at a selected point in the path before introduction of the mixture into the burner.

A[6]

54. (Once Amended) The system of Claim 45, wherein the air/steam mixture further comprises water in at least a part of a path between the fuel cell and a point of introduction into the burner.

A[7]

61. (New) The method of Claim 1, further comprising preheating at least one of a steam fuel mixture, anode gas, and steam.

62. (New) The method of Claim 61, wherein the preheating is performed through concentrically arranged annuli.

63. (New) The fuel reformer of Claim 18, further comprising a shell-type exchanger having annuli with gaps formed between the shells between which heat is exchanged.

64. (New) The fuel reformer of Claim 63, wherein the annuli are arranged around a centrally located heat exchanger through which expanded burner exhaust is routed.

65. (New) The fuel reformer of Claim 63, further comprising at least one of a high temperature shift bed, a low temperature shift bed, a burner, a partial oxidation reactor, and an autothermal reformer around which the small gap annuli are arranged.

A?

66. (New) A hydrocarbon reforming reactor comprising a fuel reformer having a shell-type exchanger having shells with gaps in the annuli between shells, into which heat from at least one of a burner, burner exhaust, a high temperature shift bed, a low temperature shift bed, a partial oxidation reformer, and an autothermal reformer is transferred and used to preheat reforming feedstock and burner fuel through the shell walls of adjacent gaps.

67. (New) The fuel reformer of Claim 66, wherein reforming feedstock includes at least one of fuel, steam, and a fuel/steam mixture.

68. (New) The fuel reformer of Claim 66, wherein burner fuel includes at least one of anode gas and cathode gas from the integrated fuel cell.

69. (New) The fuel reformer of Claim 66, further comprising an expander into which burner exhaust is routed.

70. (New) The fuel reformer of Claim 69, further comprising a centrally located passage through which exhaust from the expander is routed, and around which the annular shells are arranged.

71. (New) The fuel reformer of Claim 66, further comprising a reformer having seven shells.

72. (New) The fuel reformer of Claim 71, wherein anode gas, cathode gas, fuel, and a fuel/steam mixture are preheated.

73. (New) The fuel reformer of Claim 66, wherein at least one burner and a reforming catalyst are contained in the same annulus shell.

74. (New) A method of reforming hydrocarbons to provide a hydrogen rich gas comprising the steps of:

generating heat by performing at least one of combustion, partial oxidation, water gas shift, autothermal reforming and selective oxidation;

transferring generated heat through walls of shells in a plurality of nested shells having an annular gap being defined between each of the successive shells;

preheating a stream of hydrocarbon feed stock in a gap;

preheating a stream of steam in a second gap;

preheating a stream of fuel for a burner in a third gap; and

introducing the hydrocarbon feed stock and steam to a bed of reforming catalyst.

75. (New) The method of claim 74, wherein the hydrocarbon feed stock stream and the steam stream are a single mixed stream.

76. (New) The method of claim 74, further comprising routing a heated stream through an annularly disposed gap and transferring heat from the heated stream to material in another gap.

77. (New) A reactor for generating a hydrogen-enriched reformate from hydrocarbon feed stocks comprising:

shells having walls arranged coaxially about each other;

a gap being defined between each of the successive shells, the shells being configured to permit heat transfer directly from one gap to another through the shell walls;

wherein a first gap is configured to conduct a steam reforming reaction, and at least one of the exothermic reactions from the group consisting of combustion, partial oxidation, autothermal reforming, water gas shift, preferential oxidation, and combinations thereof; and